

# **“KNOCK-KNOCK”**

Community Stakeholder Perspective  
on Vapor Intrusion

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Center for Public Environmental Oversight

Nation Forum on Vapor Intrusion

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“Who’s there?”

“I’m here from the government (or a private polluter) to tell you that we need to drill holes in your floor because cancer-causing substances may be intruding into your home around the clock.”

# Key Issues

- Communications
- Property Value
- Sampling
- Mitigation
- Source Control
- Long-Term Management & Monitoring
- Land Use & New Construction
- Standards

# Communications



# Property Value



# Sampling





# Sampling



# Sampling

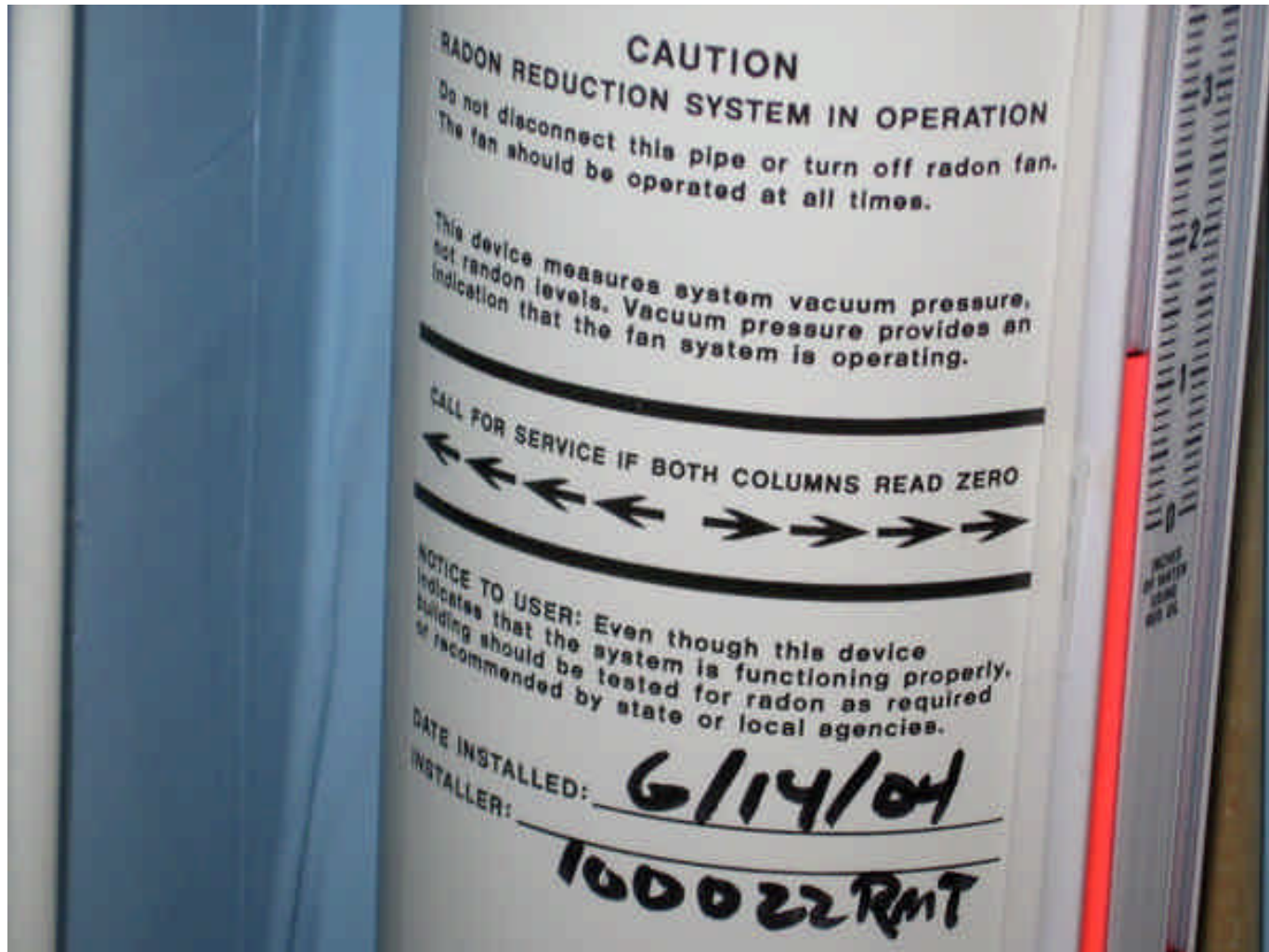




# Sampling



# Mitigation



# Mitigation






# Mitigation



# Source Control




# Source Control



AGVIO  
CHEM-FILL

## Site 89 Treatability Studies

Marine Corps Base, Camp Lejeune, NC



NAVFAC

Contract: N00014-04-1-0481  
Task Order: J75

Point of Contact:  
MARCUS ALLEN: (717) 322-4631  
MOB: (717) 877-9467

### FOUR TREATABILITY STUDIES BEING CONDUCTED


**Air Sparging using Horizontal Well** – air is injected into the aquifer to strip volatile organic compounds from groundwater.

**Ferox Injections** – iron is injected into the aquifer to reduce chlorinated compounds.

**ERO Substrate Injections** – substrate is injected to encourage microorganisms to degrade chlorinated compounds in groundwater.

**Permeable Reactive Barrier** – “wall” of reactive material that treats groundwater as it passes through.

**Start Up:** November 2006  
**Six Month Study Period**



Aerial map of Site 89 showing the locations of various wells and treatment areas. The map includes labels for 'WELL 1' through 'WELL 5' and 'WELL 6'. It also shows a 'PERMEABLE REACTIVE BARRIER' and 'AERATED ZONE'. The map is overlaid with a grid and color-coded areas.

Air Sparging Treating PCE & TCE Contaminated Groundwater



# Source Control



# Long-Term Management & Monitoring



# Long-Term Management & Monitoring





# Long-Term Management & Monitoring



# Land Use & New Construction



# Land Use & New Construction





# Land Use & New Construction



# Land Use & New Construction

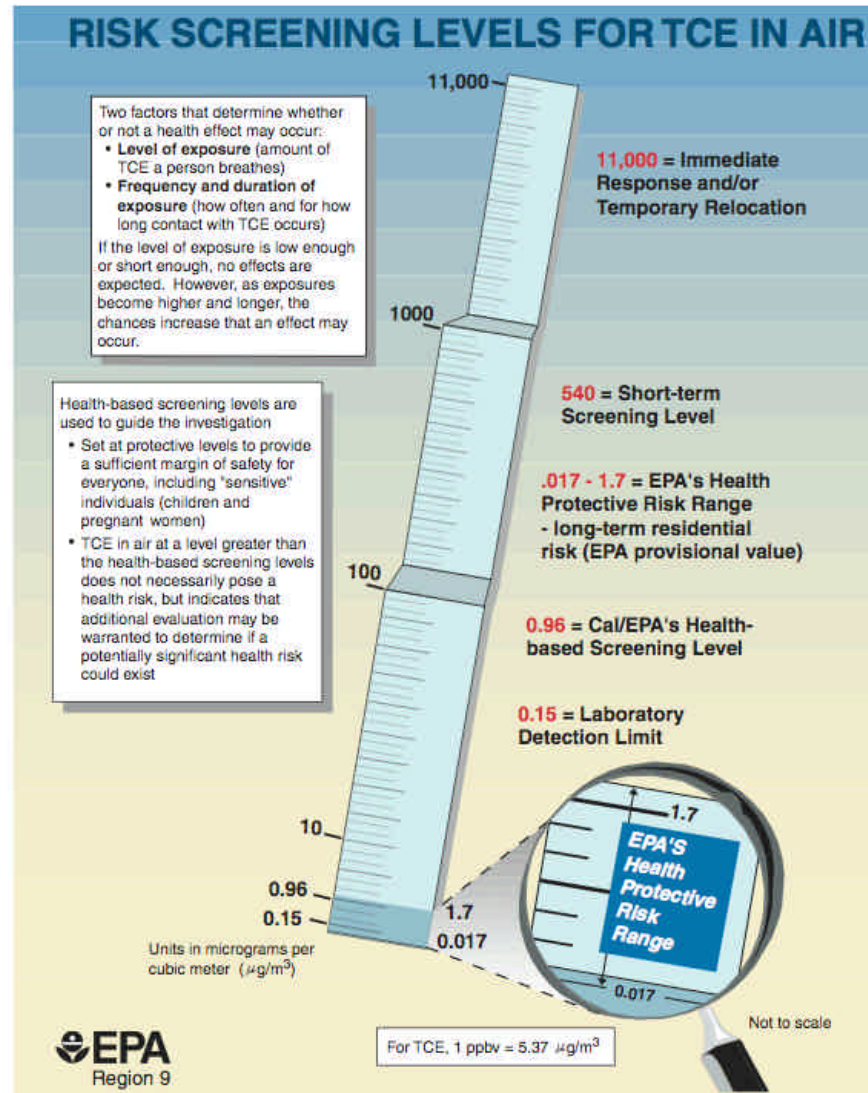


# Land Use & New Construction

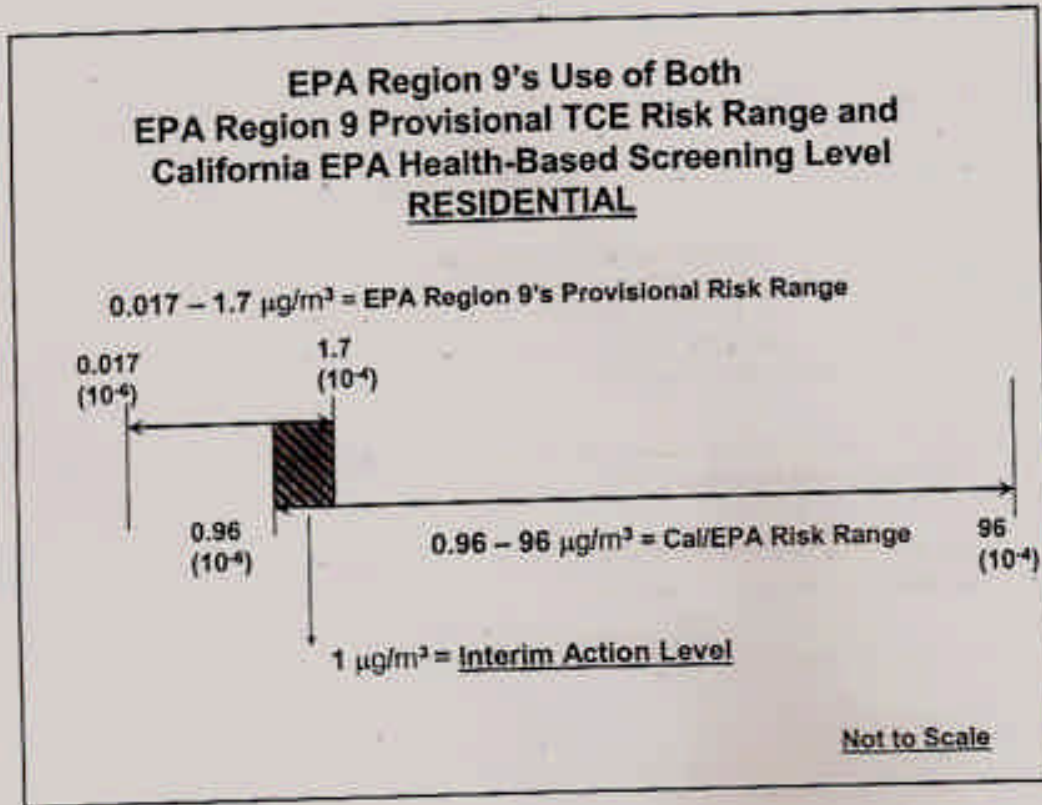




# Standards



# Standards



# Standards

## Soil Vapor/Indoor Air Matrix 1

October 2006

SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m <sup>3</sup> )	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m <sup>3</sup> )			
	< 0.25	0.25 to < 1	1 to < 5.0	5.0 and above
< 5	1. No further action	2. Take reasonable and practical actions to identify source(s) and reduce exposures	3. Take reasonable and practical actions to identify source(s) and reduce exposures	4. Take reasonable and practical actions to identify source(s) and reduce exposures
5 to < 50	5. No further action	6. MONITOR	7. MONITOR	8. MITIGATE
50 to < 250	9. MONITOR	10. MONITOR / MITIGATE	11. MITIGATE	12. MITIGATE
250 and above	13. MITIGATE	14. MITIGATE	15. MITIGATE	16. MITIGATE

### No further action:

Given that the compound was not detected in the indoor air sample and that the concentration detected in the sub-slab vapor sample is not expected to significantly affect indoor air quality, no additional actions are needed to address human exposures.

### Take reasonable and practical actions to identify source(s) and reduce exposures:

The concentration detected in the indoor air sample is likely due to indoor and/or outdoor sources rather than soil vapor intrusion given the concentration detected in the sub-slab vapor sample. Therefore, steps should be taken to identify potential source(s) and to reduce exposures accordingly (e.g., by keeping containers tightly capped or by storing volatile organic compound-containing products in places where people do not spend much time, such as a garage or outdoor shed). Resampling may be recommended to demonstrate the effectiveness of actions taken to reduce exposures.

### MONITOR:

Monitoring, including sub-slab vapor, basement air, lowest occupied living space air, and outdoor air sampling, is needed to determine whether concentrations in the indoor air or sub-slab vapor have changed. Monitoring may also be needed to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined on a site-specific and building-specific basis, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

### MITIGATE:

Mitigation is needed to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system, and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

### MONITOR / MITIGATE:

Monitoring or mitigation may be recommended after considering the magnitude of sub-slab vapor and indoor air concentrations along with building- and site-specific conditions.

See additional notes on page 2.

MATRIX 1 Page 1 of 2



# Guidance

- States
  - New York
  - California
  - New Jersey
  - ITRC
- Federal
  - EPA (2002 draft)
  - DOD — hopefully out soon

# Lessons

- Residents' cooperation is essential.
- Explain carefully and simply.
- People prefer direct air measurement.
- Residents like “blanket” mitigation.
- Source cleanup is the long-term solution.
- Monitor for the life of the contamination.
- Address VI before building.
- Protective standards are needed.
- Federal guidance is overdue.

E-mail me or give me your card if you want to join CPEO's free *Brownfields Internet Forum* and/or *Military Environmental Forum* newsgroup.

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